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REMARKS

Applicant respectfully requests reconsideration of the present application in view of the foregoing amendments and in view of the reasons which follow.

Claims 1-20 stand rejected. Claims 1, 6, 8, 12, 15-16 and 18-19 have been amended. No new matter is added. After amending the claims as set forth above, claims 1-20 remain pending in this application.

In paragraphs 1-3 of the Office Action, claims 1-20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,142,386 (Ishihara) or U.S. Patent No. JP05-027111 (Toshiharu). The Examiner states:

> Ishihara discloses (col. 2, lines 17-25; col. 4, line 53-col. 5, line 5) and shows in Fig. 3 and Toshiharu discloses in the abstract a method for repairing defects in an active matrix liquid crystal display, the method comprising:
>
> - locating a defective pixel in the liquid crystal display;
>
> -focusing a laser on a portion of a color filter corresponding to the defective pixel; and
>
> at least partially ablating the portion of the color filter corresponding to the defective pixel using the laser.
>
> As to the limitations of applying power to the liquid crystal display and backlighting the display while power is applied, is common and known in the art and thus would have been obvious to avail a proven technology.
>
> As to using method for repairing defect in a normally white liquid crystal display is considered as intended use and thus would have been obvious.
>
> Accordingly, claims 1, 2, 6, 12, 13, 17 and 18 would have been obvious.
>
> As to claims 3 and 14, using a color vision system to locate defective pixel is common and known in the art and thus would have been obvious to avail a proven system.
>
> As to claims 4 and 15, using a controller to control the laser is common and known in the art and thus would have been obvious to avail a proven technology.

> As to claim 7, repeating th steps of locating, focusing and ablating to correct plurality of defects on the liquid crystal display is considered as intended use and thus would have been obvious.
>
> As to claim 8, using a motion control system to control the motion of the laser is common and known in the art and thus would have been obvious to avail a proven technology.
>
> As to claims 5, 9, 16 and 19, typically a laser is focused in the visible wavelength range.
>
> As to claims 10 and 20, typically a vision system includes a camera equipped with automatic focus and automatic zoom that scans the LCD.
>
> As to claim 11, using a mask to block laser light from ablating portions of the color filter associated with non-defective pixel is common and known in the art and thus would have been obvious to optimize performance.

Applicant respectfully traverses the rejection. Ishihara and Toshiharu are referred to below as the cited art.

To advance prosecution, Applicant has amended independent claims 1, 8 and 12 to recite that the limitation of the color filter is "discolored" by laser ablation. Applicant notes that the term "discolor" as understood by one of ordinary skill in the art is different than the term "blackened" as used in Ishihara. The present application describes a process that discolors defective pixels without providing excessive damage to the remaining parts of the liquid crystal display (e.g. substrates). The Specification states:

> [A]blation of a pixel is accomplished by discoloring the corresponding portion of the color filter.

See present application, page 7, lines 12-14. The Specification also states:

> During this process, pixel 126A is discolored to a desired or acceptable level which may be application specific for particular displays or for particular uses on the displays. In general, red pixels and green pixels that are defective usually need discoloration more than defective blue pixels. Defective blue pixels may not need any discoloration due to their limited and adverse impact on viewers.

See present application, page 6, lines 14-24. Further, the Specification states:

> The ablation is achi ved by creating minimal damage to the color filter and no damage to glass substrate 124. Laser 112 is applied to color filter 122 until color filter 122 is discolored to an acceptable level.

See present application, page 8, lines 33-35 (emphasis added). Yet further, the Summary of the invention in the present application states:

> A laser operating with a 780-840nm wavelength in the visible range permits the ablation of the pigmented color filtered material coated or adhered to a glass substrate of the LCD without causing thermal or mechanical damage to the glass substrate. The laser is used to darken the defective pixel by focusing on a color filter of the defect pixel. After a portion of the color filter is darkened, a minor defect exists instead of a major defect.

See present application, page 3, lines 1-12. Therefore, discoloration of the color filter is explicitly recited in independent claims 1, 8 and 12 and the advantageous feature is discussed throughout the Specification.

In direct contrast, Ishihara discloses the "blackening" of color filter 30. "Blackening" causes maximum damage to the color filter. Ishihara states:

> In this case, a laser beam 34 is radiated to the defective pixel as shown in Figure 3, so that the color filter 30 is burned and blackened. In addition, the rub surface of the individual transparent electrode 22 is seated by the radiated laser beam and therefore, disturbed by heat, so that the molecular orientation of the liquid crystal in contact with the disturbed rubbed surface of the individual transparent electrode 22 is also disturbed. . . This disturbance of the molecular orientation of liquid crystal will not be returned to the aligned condition, even if the liquid crystal is cooled. With the blackening of the color filter 30 and /or the disturbance of the molecular orientation of the liquid crystal will cause the defective pixel to have a gray color, preferably, in mid-point tones between white and black.

See Ishihara, column 4, lines 53-55 (emphasis added). Accordingly, Ishihara does not realize the more delicate ablation technique which merely discolors the color filter and instead burns and destroys the color filter and the structure near it.

Ishihara even recommends destroying the liquid crystal cell itself. Indeed, in one embodiment of Toshiharu, the liquid crystal cell is subjected to voltages to further destroy it.

See Ishihara, column 5, lines 11-27. Clearly th principles of Ishihara are th antithesis of the more elegant approach of the present application. Therefore, withdrawal of the rejection of claims 1-20 based upon Ishihara are respectfully requested.

Toshiharu relates to a method of correcting defects on a color filter on a glass substrate. Toshiharu does not even relate to the correction of defective pixels in a liquid crystal display. Instead, Toshiharu is related to correcting defects in the color filters for use in liquid crystal displays. Toshiharu does not indicate that the defect in the color filter is corrected after the liquid crystal display is completed. Therefore, Toshiharu cannot possibly show the method and the system of the present invention because it merely operates on a color filter, not on a completed liquid crystal display. Indeed, Toshiharu states that "the color filter is generated with the defect is [sic] removed this way." Toshiharu, Abstract. Applicant notes that Figure 2 of Toshiharu does not show an LCD cell. Therefore, withdrawal of the rejection based on Toshiharu is respectfully requested because it is not even related to the correction defects in a liquid crystal display.

Further, independent claim 1 recites an additional limitation in which the glass substrate associated with the color filter is not damaged. The Specification states:

> The ablation is achieved by creating minimal damage to the color filter and no damage to the glass substrate.

See present application, page 8, lines 34-36. As discussed above, Toshiharu does not even show a liquid crystal display. In Ishihara, color filter 30 is burned and blackened with such heat that electrode 22 is affected. Indeed, electrode 28 and the glass substrate is likely also affected. Therefore, claim 1 and its dependent claims 2-7 are additionally patentable over the cited art.

With respect to dependent claims 6 and 15, the level of discoloration is selected in accordance with the original color associated with the pixel. The Specification of the present application states:

> During this process, pixel 126A is discolored to a desired or acceptable level, which may be application specific. . . . In general, red pixels and green pixels that are defective usually need discoloration more than defective blue pixels.

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Se present application, pag 6, lin s 14-22. Only on l vel of darkening (blackening) is described in Ishihara. Discoloration is not described in Toshiharu. Accordingly, dependent claims 6 and 15 are patentable over the cited art.

Dependent claim 18 recites that the color filter only discolors a filter substrate side of the color filter. Again, Ishihara describes the burning of the color filter such that electrode 22 is heated. This indicates that the side farther from the substrate 28 is also discolored and damaged due to the process of ablation. Again, Toshiharu is not related to correcting defective pixels. Accordingly, claim 18 is patentable over the cited art.

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

Respectfully submitted,

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